# Release notes for ENDF/B Development n-027_Co_058m1 evaluation


April 26, 2017

- `psyche` Warnings:
  1. Strength function in URR not in agreement with PSYCHE's expectations
     *FILE 2 / SECTION 151 / ISOTOPE MASS = 58. L = 0 / STRENGTH FUNCTION IS 7.69134E-02 / STRENGTH FUNCTION 7.69134E-02 / LIES OUTSIDE LIMITS 1.00000E-04 TO 9.00000E-04 (0): URR str. ftn.*

```
FILE  2
   SECTION 151
        ISOTOPE MASS =  58. L =  0
                 STRENGTH FUNCTION IS  7.69134E-02
                                STRENGTH FUNCTION 7.69134E-02
... [1 more lines]
```

  2. Non-threshold reaction with Q value differing from PSYCHE's expectations
     *FILE 3 / SECTION 103 / THE CALCULATED Q 2.89707E+06 DISSAGREES WITH THE GIVEN Q 3.09000E+06 (0): Iffy Q*

```
FILE  3
   SECTION 103
            THE CALCULATED Q  2.89707E+06 DISSAGREES WITH THE GIVEN Q  3.09000E+06
```

  3. Non-threshold reaction with Q value differing from PSYCHE's expectations
     *FILE 3 / SECTION 107 / THE CALCULATED Q 3.32367E+06 DISSAGREES WITH THE GIVEN Q 3.51300E+06 (0): Iffy Q*

```
FILE  3
   SECTION 107
            THE CALCULATED Q  3.32367E+06 DISSAGREES WITH THE GIVEN Q  3.51300E+06
```

- `linear` Errors:
  1. Negative cross section found
     *0: Neg. Sig(E)*

```
  Linearize ENDF/B Cross Sections (LINEAR 2015-1)
  ------------------------------------------------------------------------------
  Retrieval Criteria-----------        MAT
  Monitor Mode-----------------        Off
  Minimum Cross Section-------- 1.0000E-10 (Default Option)
... [66 more lines]
```

- `recent` Warnings:
  1. Statistical weight of certain L values were incorrect
     *0: RRR goof (a)*

```
 Calculate Cross Sections from Resonance Parameters (RECENT 2015-1)
 ==============================================================================
 Retrieval Criteria-----------        MAT
 File 2 Mimimum Cross Section- 1.0000E-10 (Standard Option)
 Reactions with No Background-     Output (Resonance Contribution)
... [130 more lines]
```

- `fudge-4.0` Warnings:

    1. Missing a channel with a particular angular momenta combination
    *resonances / resolved (Error # 1): missingResonanceChannel*

    ```
    WARNING: Missing a channel with angular momenta combination L = 0, J = 3.5 and S = 3.5 for "capture"
    WARNING: Missing a channel with angular momenta combination L = 0, J = 5.5 and S = 5.5 for "capture"
    ```

    2. Potential scattering hasn't converted, you need more L's!
    *resonances / resolved (Error # 2): potentialScatteringNotConverged*

    ```
    WARNING: Potential scattering hasn't converged by L=0 at E=500.0 eV, xs[0]/xs[0]=100.0% > 0.1%
    ```

    3. Cross section does not match sum of linked reaction cross sections
    *crossSectionSum label 0: total (Error # 0): CS Sum.*

    ```
    WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 19.28%
    ```

    4. Cross section does not match sum of linked reaction cross sections
    *crossSectionSum label 1: (z,n) (Error # 0): CS Sum.*

    ```
    WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 92.26%
    ```

- `fudge-4.0` Errors:

    1. The spin statistical weights are off, indicating missing channels
    *resonances / resolved / MultiLevel_BreitWigner (Error # 0): badSpinStatisticalWeights*

    ```
    WARNING: The spin statical weights for L=0 sums to 0.454545454545, but should sum to 1.0.  You have too few chan
    ```

    2. Calculated and tabulated Q values disagree.
    *reaction label 14: n[multiplicity:'2'] + Co57 (Error # 0): Q mismatch*

    ```
    WARNING: Calculated and tabulated Q-values disagree: -8532477.994529724 eV vs -8.4528e6 eV!
    ```

    3. Calculated and tabulated Q values disagree.
    *reaction label 15: n + H1 + Fe57 (Error # 0): Q mismatch*

    ```
    WARNING: Calculated and tabulated Q-values disagree: -6914204.872016907 eV vs -7.863e6 eV!
    ```

    4. Calculated and tabulated Q values disagree.
    *reaction label 16: Co59 + gamma (Error # 0): Q mismatch*

    ```
    WARNING: Calculated and tabulated Q-values disagree: 10494365.16943359 eV vs 1.045e7 eV!
    ```

    5. Calculated and tabulated Q values disagree.
    *reaction label 17: n + He4 + Mn54 (Error # 0): Q mismatch*

    ```
    WARNING: Calculated and tabulated Q-values disagree: -6674910.646324158 eV vs -6.715e6 eV!
    ```

    6. Calculated and tabulated Q values disagree.
    *reaction label 18: H1 + Fe58_s (Error # 0): Q mismatch*

    ```
    WARNING: Calculated and tabulated Q-values disagree: 3130399.793022156 eV vs 3.09e6 eV!
    ```

7. Calculated and tabulated Q values disagree.
   *reaction label 19: H2 + Fe57_s (Error # 0): Q mismatch*

```
WARNING: Calculated and tabulated Q-values disagree: -4689638.771087646 eV vs -3.9316e6 eV!
```

8. Calculated and tabulated Q values disagree.
   *reaction label 20: He4 + Mn55_s (Error # 0): Q mismatch*

```
WARNING: Calculated and tabulated Q-values disagree: 3551616.669075012 eV vs 3.513e6 eV!
```

- `njoy2012` Warnings:

1. Evaluation has no unresolved resonance parameters given
   *unresr...calculation of unresolved resonance cross sections (0): No URR*

```
 ---message from unresr---mat 2723 has no unresolved parameters
                          copy as is to nout
```

2. Evaluation has no unresolved resonance parameters given
   *purr...probabalistic unresolved calculation (0): No URR*

```
 ---message from purr---mat 2723 has no unresolved parameters
                          copy as is to nout
```

3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   *groupr...compute self-shielded group-averaged cross-sections (0): GROUPR/conver (0)*

```
 ---message from conver---cannot do complete particle production for mt= 16
                          only mf4/mf5 provided
```

4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   *groupr...compute self-shielded group-averaged cross-sections (1): GROUPR/conver (0)*

```
 ---message from conver---cannot do complete particle production for mt= 22
                          only mf4/mf5 provided
```

5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   *groupr...compute self-shielded group-averaged cross-sections (2): GROUPR/conver (0)*

```
 ---message from conver---cannot do complete particle production for mt= 28
                          only mf4/mf5 provided
```

6. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   *groupr...compute self-shielded group-averaged cross-sections (3): GROUPR/conver (0)*

```
---message from conver---cannot do complete particle production for mt= 91
                         only mf4/mf5 provided
```

- `acelst` Warnings:

  1. generic warning message
     *0: Warning*

```
 ACELST WARNING - More than one range for MF/MT           6          91
STOP ACELST Completed
```